

WHAT IS CLAIMED IS:

1. A method of performing color space conversion and under color removal, said method comprising the steps of:

providing an intensity word for a first, second, and third color for each of four
5 pixels;

subtracting each said intensity words for said first, second, and third colors from a
maximum intensity word to obtain an initial intensity word for a first, second, and third
complementary color;

comparing said first, second, and third complementary color initial intensity words
10 for each pixel to determine a minimum color intensity word for each pixel;

setting an initial combined color intensity word equal to said minimum color
intensity word for each pixel;

determining an output intensity word for each of said three complementary colors,
each of said output intensity words for said complementary colors equal to said initial
15 complementary color intensity word minus a scaled value of said initial combined color
intensity word, each of said output intensity words for said complementary colors limited
to a range bounded by a minimum and maximum producible intensity; and

determining an output intensity word for said combined color, said output intensity
word for said combined color equal to scaled value of said initial combined color intensity
20 word and limited to a range bounded by a minimum and maximum producible intensity.

2. The method of Claim 1, said comparing step performed by the simultaneous pixel-wise
comparison of two of said first, second, and third complementary color initial intensity

words for four pixels, the result of the comparison then being compared to a third of said first, second, and third complementary color initial intensity words.

3. The method of Claim 1, said step of determining an output intensity word for each of said three complementary colors involving the use of a lookup table to scale said initial
5 combined color intensity words.

4. The method of Claim 1, said step of determining an output intensity word for each of said three complementary colors comprising the steps of:

subtracting a common value from each of said initial intensity words for said first, second, and third complementary colors to yield an intermediate value, said common value
10 based on said minimum color intensity word.

5. The method of Claim 4, said step of determining an output intensity word for each of said three complementary colors further comprising the step of:

scaling said intermediate value.

6. The method of Claim 4, said step of determining an output intensity word for each of said
15 three complementary colors further comprising the step of:

scaling said intermediate value using a transfer function lookup table.

7. The method of Claim 4, said step of determining an output intensity word for each of said three complementary colors further comprising the step of:

limiting said intermediate value to a positive value.

20 8. The method of Claim 4, said step of determining an output intensity word for each of said three complementary colors further comprising the step of:

limiting said intermediate value to a value capable of being expressed by an unsigned n-bit binary word.

9. The method of Claim 4, said subtracting step comprising the step of:

providing a minuend, said minuend represented in unsigned binary format by n bits;

providing a subtrahend, said subtrahend represented in 2's complement format by $n+1$ bits, wherein n bits comprise a magnitude portions and a most significant bit is a sign bit;

subtracting said subtrahend from the minuend to yield an n -bit result, wherein said subtraction has the effect of adding both the compliment of said magnitude portion and a one to the minuend;

logically ORing each bit of said result with the logical AND of said carry-out and said sign bit; and

logically ANDing each bit from said logically ORing step with the logical OR of said carry-out bit and said sign bit to yield an output bit, wherein each output bit is a logical "0" when said minuend minus said subtrahend is a negative number, a logical "1"

when said minuend minus said subtrahend is greater than 2^n-1 , and equal to a

corresponding bit of said n -bit result when said minuend minus said subtrahend is a positive number less than 2^n-1 .

10. The method of Claim 1, said step of determining an output intensity word for said combined color involving the use of a lookup table to scale said initial combined color intensity word.

11. The method of Claim 1, said step of determining an output intensity word for said combined color involving the use of a single lookup table to scale said initial combined color intensity word, said lookup table incorporating a gamma function.

12. The method of Claim 1, said step of determining an output intensity word for said combined color involving the use of a single lookup table to scale said initial combined color intensity word, said lookup table compensating for the non-linear response of a printer.

5 13. A method of efficiently subtracting two binary number and limiting the result to the range of 0 to 2^n-1 , where n = the number of binary bits used to represent the number, said method comprising:

providing a minuend, said minuend represented in unsigned binary format by n bits;

10 providing a subtrahend, said subtrahend represented in 2's complement format by $n+1$ bits, wherein n bits comprise a magnitude portions and a most significant bit is a sign bit;

subtracting said subtrahend from the minuend to yield an n -bit result, wherein said subtraction has the effect of adding both the compliment of said magnitude portion and a one to the minuend;

15 logically ORing each bit of said result with the logical AND of said carry-out and said sign bit; and

20 logically ANDing each bit from said logically ORing step with the logical OR of said carry-out bit and said sign bit to yield an output bit, wherein each output bit is a logical "0" when said minuend minus said subtrahend is a negative number, a logical "1" when said minuend minus said subtrahend is greater than 2^n-1 , and equal to a corresponding bit of said n -bit result when said minuend minus said subtrahend is a positive number less than 2^n-1 .